The Week In Engineering and Construction

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Order halting non-essential construction drafted by WPB

Residential construction under $1,000 and other work under $25,000 exempted. No dearth of construction activity seen as officials seek means of speeding tempo.

The long-expected, constantly postponed stop-order on non-essential construction will probably be issued this week. Issuance of the order has been directed by top WPB officials, but questions of language are still in dispute, however, and this might again delay its issuance. Already drafted, it will forbid initiation of any construction project which does not carry a priority rating.

However, the order will exempt residential construction costing less than $1,000 and non-residential construction costing less than $25,000. It is over these exemptions that dispute still rages. The exemptions are supported, in general, by the production division of WPB but are opposed by important officials in the division of industry operations—priorities—who feel that any such exemption would be an invitation to evasion. By splitting projects and by making deliberately low advance estimates of cost, altogether too many jobs could be brought in under such exemptions, it is felt.

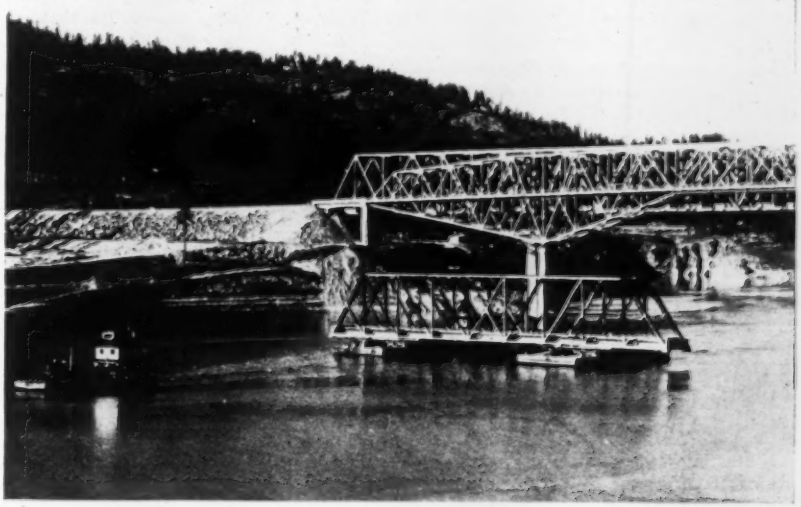
Industry operations officials are still fighting for an order which would exempt nothing except reconstruction and rehabilitation using no critical materials.

The forthcoming order is designed to end widespread evasion of priority controls over construction materials. The famous order SPAB 9, issued last October, warned that priority aid would only be granted to projects essential to defense or maintenance of the civilian economy. Belief then was that it would soon become impossible to build anything without priority assistance.

This would now be the case if priority rules were universally observed. But—and the situation is not confined to construction—they are not observed. A builder who knows the ropes and is willing to pay a price can still get almost anything he needs. So much is this the case that some housebuilders who have been granted ratings under the defense housing priority plan have decided they don't need the rating and have turned it back, thus escaping the $6,000 cost limit imposed on private defense housing.

The stop order, when issued, will certainly not mean that there will be any dearth of construction activity this year. In fact WPB officials are now anxious to find ways of speeding up the rate of construction. According to the latest official estimates, nearly fourteen and a half billion dollars worth of construction is lined up for 1942. In the face of this demand, construction expenditures in January amounted to $500,000,000, in February to $520,000,000. March expenditures are estimated at $580,000,000, and April at perhaps $610,000,000, far below the needed rate.

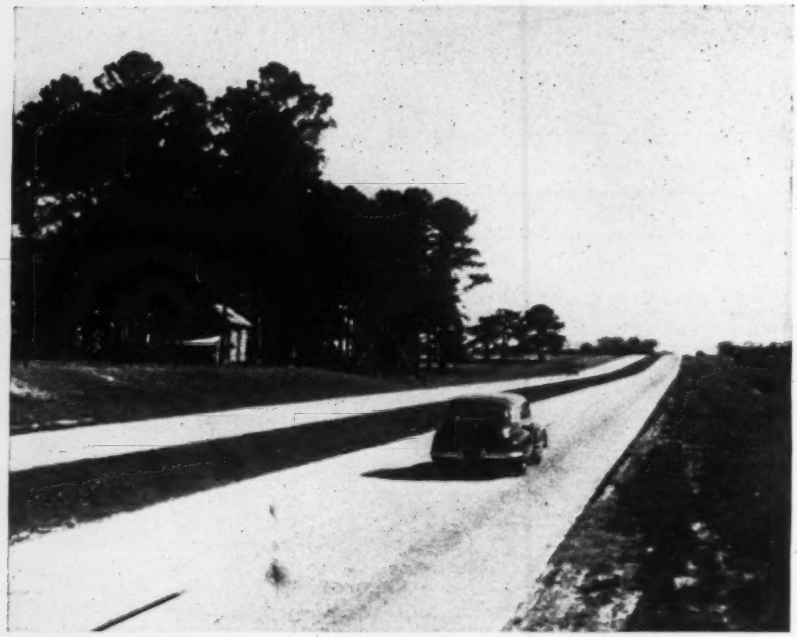
Private housebuilding, too, will continue at a greater than normal rate, though it will be restricted to certain areas and to houses costing less than $6,000 or renting for less than $50 a month. WPB this week decided to grant priorities to 200,000 more privately-financed dwellings. Priorities have now been granted to the full 200,000 units approved last September, and ratings are already being granted from the new allotment.



Bridge displaced by Coulee Lake floated to new duties

Sections of an old steel railroad bridge floating under the spans of a new structure are a unique sight on Grand Coulee Dam reservoir as Bureau of Reclamation crews move the old bridge from its former location at Marcus, Wash., to the dam's powerhouse site. Steel in the old span will be used as a framework for a large equipment, storage and fabricating plant.

The floating span above is one of the seven sections of the old Great Northern Railway bridge at Marcus, near Kettle Falls, which has been replaced by a new structure well above the estimated maximum height of reservoir water. Built in seven sections, the old bridge contains 965 tons of structural steel, 306,000 board-feet of timber, and 150 tons of miscellaneous metals. Sections are placed aboard Bureau of Reclamation barges and towed by a motor barge to the foot of the lake. The journey down the reservoir requires about 22 hours.



South Carolina completes divided highway project

The South Carolina State Highway Department has announced completion of a 10-mile section of U. S. Highway No. 52 between Darlington and Florence, extending the former two-lane, 18-ft., roadway to two 22-ft. roadways separated by an 18-ft. grass parkway, merging into 50-ft. streets within city limits.

The original pavement, put down in 1925, was an asphaltic concrete surface course on a cement concrete base. Traffic on this road had increased from about 576 vehicles in 1925 to a total of 2,417 vehicles in 1940, and the old pavement was badly disintegrated. It was finally decided to widen and resurface the old pavement slab as two of the new traffic lanes, and to construct an entirely new pavement for the other roadway.

The resurfacing feature of the project is somewhat unique in that it is the first time in South Carolina that a bituminous pavement has been resurfaced with cement concrete. The cement concrete top has a minimum thickness of 5 in. where the new work is entirely supported by the old pavement, but beyond the edges of the old pavement, the thickness is 7 to 8 in. To provide for uniform expansion in both the old and new slabs, openings were made across the old slabs the same distances apart as specified for openings in the new. The added lanes have an entirely new concrete pavement conforming to the standard design of 22 ft. wide and 8 in. thick at the edges, tapering to 6½ in. uniform thickness 3 ft. from the edges.

War moves and adjustments in nation's capital

Many actions at Washington reflect the U. S. government's steady progress toward full war-time efficiency. Some of those actions, each reflecting a trend, last week were:

Starting a program of using the technical staff of the WPA to help in the emergency public works program being handled by the Federal Works Agency, FWA has assigned five projects to Works Projects Administration. It is not intended that this work be done with relief labor. In fact, a prevailing wage clause in the Lanham Act, under which the work is being done, prevents handling the projects as relief jobs. Instead WPA, functioning as an ordinary engineering and construction agency, will award the contracts. The five projects are for water and sewer facilities with a total cost of $628,000 in towns and cities needing new facilities for defense workers.

Records of the war construction program of the Corps of Engineers and of the former construction division of the Quartermaster Corps are being microfilmed—photographed in reduced size on movie film. The project, just getting underway will permit storage of records now occupying the equivalent of 12,000 four-drawer cabinet in about 50 cabinets. It will take 18 months.

The scope of construction work being carried on by the United States in foreign countries was emphasized last week in the President's report on lend-lease activities. On the route to China, port facilities in India are being enlarged, the Burma Road is being improved, a railway paralleling the Burma Road is being constructed, and "New Routes" to China are being developed. In China itself, construction work includes an automotive spare parts depot and a truck assembly plant.

On the route to Russia, work includes enlargement of port facilities and assembly plants on the Persian Gulf and improvement of the railroad through Iran to the Caspian Sea. In Iran, pipelines, ordnance workshops, and food canning factories are under construction.

In Egypt, Eritrea, and Palestine, repair and assembly shops are being built, harbors improved, and military communications generally stepped up.

War contractors would be exempt from all state and local sales taxes, use taxes, taxes on gross income, storage taxes, taxes on employment or use of labor other than social security taxes under the terms of a bill which has been favorably reported to the House by the Ways and Means Committee. A war contractor would be broadly defined and not restricted to firms having contracts directly with the government. On firm price contracts, the tax exemption would be conditioned on return to the government of the tax saving. Collection of taxes which have accrued since Sept. 8, 1939, would be prevented, but no refunds would be required.

The bill, which is supported by the War and Navy departments but is opposed by the Treasury, results from the so-called Alabama cases. In these cases the Supreme Court last November held that sale to a contractor holding a cost-plus-a-fixed fee contract are liable to state sales taxation, despite the fact that the money really comes out of the federal treasury.

Actually of course, the success or failure of the bill will make little difference to contractors. It is essentially an issue between the state and federal governments.

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Name Emmerich to replace Keyserling as FPHA head

Herbert Emmerich has been named head of the Federal Public Housing Administration, replacing Acting Commissioner Leon Keyserling as chief of this organization, which is the public construction unit of the new Federal Housing Agency.

Appointment of Emmerich does not appear to indicate any important changes

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of policy. Insofar as he has been connected with building, Emmerich, like Keyserling, is an advocate of public housing rather than of general construction. His selection is believed to portend an effort to keep war housing integrated with a long-time public housing program instead of only being directed toward meeting emergency war needs.

Emmerich's principal reputation is as an administrator—as a man who can get new agencies rolling. He had this job to do in the Farm Credit Administration and the OPM. He was at one time an officer of the public administration clearing house and was connected with the New York City Limited Dividend Housing Corp.

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Army specialist corps to put civilians in uniform

A new army specialist corps, headed by Dwight F. Davis, former Secretary of War, has been formed to establish under military control and in distinctive uniform, a selected body of skilled individuals to supply all arms under service.

For the greater part, the corps will consist of uniformed civilians who are highly qualified in professional, labor and scientific fields but who do not necessarily possess military knowledge and training. In many cases, specialist corps members, experienced in the administrative field, will release army officers from administrative posts for active combat duty.

The corps is also expected to provide a much needed uniformed organization to which civilian employees of the War Department in war areas may be transferred, in order that they may be entitled to the same rights and privileges as soldiers in case they should become prisoners of war.

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Mexico City's building program not hit by war

Building construction in Mexico City is in no immediate danger of being slowed by lack of materials, according to the Ministry of National Economy. An average of 40 railroad carloads of construction material is arriving daily in the capital.

The Ministry indicated that there will be sufficient supplies available to assure completion of all or most private and public building in Mexico City, and declared unjustified reports that a war shortage of these supplies might force a suspension of the building program. The Ministry added that the construction situation in other key Mexican cities is "good."

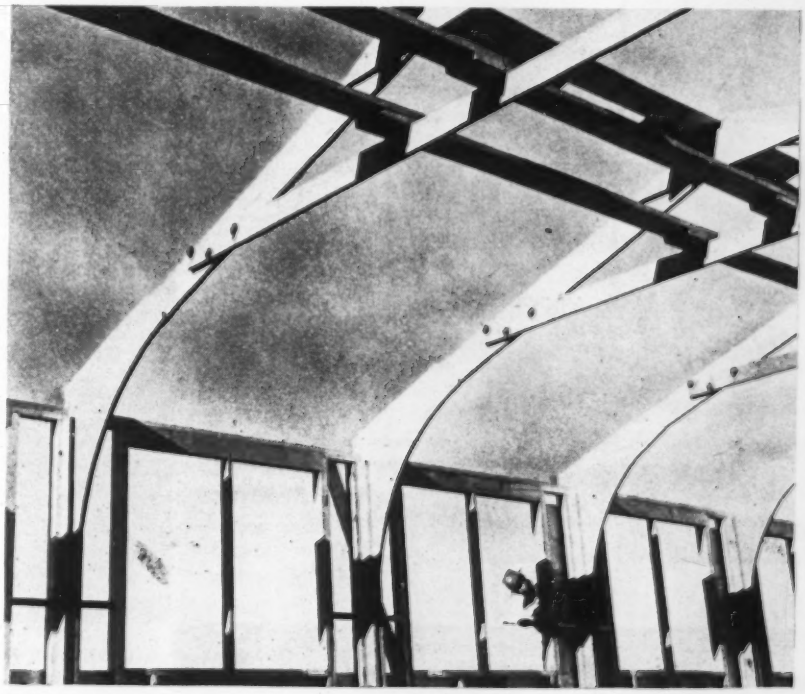
Valuation procedure upset by Supreme Court

Declaring that "the Constitution does not bind rate-making bodies to the service of any single formula or combination of formulas", the U. S. Supreme Court, in an unanimous decision handed down on March 16, completely upset the system of utility valuation for rate-making purposes that has been built up over the past 44 years based on the historic case of *Smyth vs Ames*.

The court's decision was in an attack on the constitutionality of the Natural Gas Act of 1938, brought by the Natural Gas Line Co. and the Texoma Natural Gas Co. of Texas. The Federal Power Commission, using powers conferred on it by the act in question, had prescribed interim rates for the pipe line companies pending a final determination, and these rates had not included a "going concern value" of $8,500,000.

In sustaining the action of the Federal Power Commission, the Supreme Court said further: "Once a fair hearing has been given, proper findings made, and other statutory requirements satisfied, the courts cannot intervene in the absence of a clear showing that the limits of due process have been overstepped." Heretofore, the Supreme Court has held that findings of regulatory bodies that did not consider all elements of value, as prescribed in the formula contained in the *Smyth vs Ames* decision, were unconstitutional.

Justices Black, Douglas and Murphy, in a concurring opinion, expressed the view that the court should have been more explicit in saying what regulating bodies could do, thus laying "the ghost of *Smyth vs Ames* which has haunted utility regulation since 1898." Those justices would have had the court say definitely that regulatory bodies may now adopt the "prudent investment" rate base long advocated by the late Justice Brandeis.



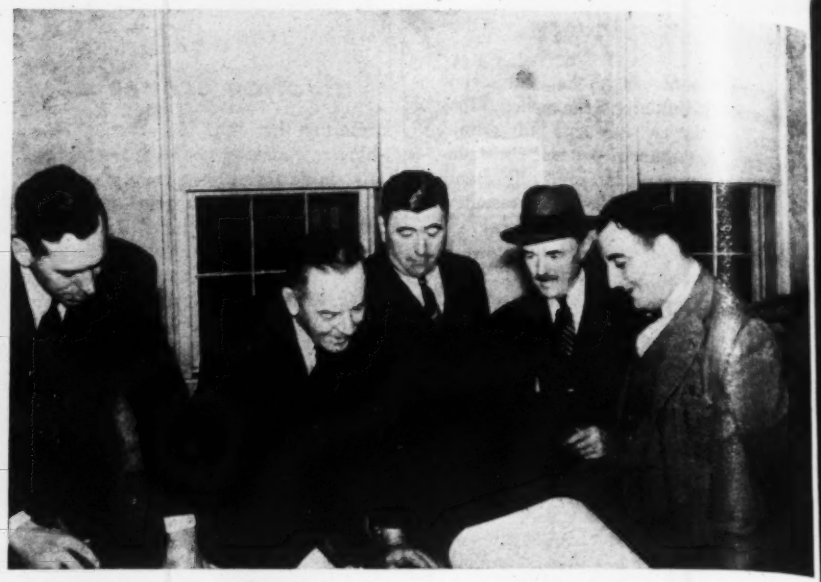
Plywood gussets stiffen camp buildings

In the construction of some of the buildings at a California army camp, departure was made from the old Army standard knee braces to give the wood frame buildings rigidity. The new design, said to be used for the first time on this construction job, consists of "wind trusses" taking the place of every fifth pair of rafters. These trusses utilize 1⅜-in. Douglas Fir plywood for transferring stress from the roof structure into the walls. The gussets are stagger-spiked between the two adjacent members of double 2x8-in. columns in the walls and are also spiked to the top cords. Each truss has a 2x6-in. raised collar joist bolted (without timber connectors) to the top cord as shown in the accompanying picture. The waste in cutting out the gussets is used for ties at the peak of the truss. The accompanying illustration shows this type of construction in a building 25 ft. 4 in. wide in which considerable additional stiffness is obtained at no extra cost.

On this job the architect-engineer contract is held by Leeds, Hill, Barnard & Jewett, Los Angeles, and the contract for construction by the Ford J. Twaits and Morrison-Knudsen Co.

W. H. HACKETT, (below) former New York State highway engineer located at Fulton, N. Y., now with the U. S. armed forces, checks a reading at Fort Belvoir, Va., on a 6,200-seat amphitheater job.

Wide World photo



Five of the engineers in charge for the U. S. Engineers on a bomber repair depot in New York State, now under construction, discuss details of the project. They are, left to right: R. D. SHEAHAN, associate engineer; W. W. WEGNER, engineer; and J. W. FISHER, R. L. FAIRBAIRN, and R. J. ABRAMSON, all associate engineers.

MEN AT WORK

R. C. REECE, (left) consulting engineer, Toledo, Ohio, has been handling the engineering work on a huge warehouse at a U. S. Army proving ground. For recreation he teaches design at Toledo University.

CAPT. W. T. HARTMAN, JR., formerly a professor of civil engineering at Virginia Polytechnic Institute, and LIEUT. ANDREW JAREMA, (right) both of the U. S. Engineer Department, helped expedite the construction of a group of warehouses at a Pennsylvania U. S. Army supply depot.

At left, JOHN J. GOULD and HENRY J. DEGENKOLB (right), examine a piece of plywood (48 ply, 4 in. thick), part of the structural timber from the San Francisco Exposition, now undergoing test. Interesting results are being obtained with eccentric timber joints in more than two dozen full-size trusses of 33 to 56-ft. span that are being tested to destruction. Some 60 or 70 full-size timber joints including modern connector types as well as plywood panels are also under test.

Communities consider problems of war-caused water shortage possibilities

Demands of new industries and influx of workers force cities to seek means of increasing supplies and services

A committee of the New Jersey state legislature has recommended to the governor that the state spend about $300,000 to expedite connections between the state's major water supply systems in order to avert shortages during the war emergency.

According to the report, there is a definite threat that some of the state's industrial areas may be short of water this summer unless the interconnections are begun at once. Threat of a shortage is most serious for municipalities supplied by the Wanaque (Newark) and Jersey City systems, the report said. However, enough water to meet the expected shortages would be available from the Newark and Passaic Valley-Little Falls system. The safe yield of the state's four major systems is placed at 219 mgd. daily when the systems are operated individually, but an estimated 287 mgd. safe yield could be obtained if the systems were interconnected.

The minimum safe yield of 33 systems in north Jersey is placed at 392 mgd. daily by the operators and at 379 mgd. daily by the Water Policy Commission. Consumption last year was 303 mgd. daily and is expected to be about 339 mgd. this year. The report said, therefore, that the difference indicates no immediate large-scale additional supply is required, but that operations should be coordinated to insure a safe margin between consumption and available supply.

Listed as most important under the proposed program are the connections between the Jersey City and Wanaque systems at Little Falls and one between the Jersey City and Newark systems.

Nassau County considers connection

Nassau County, one of the four counties on Long Island, N. Y., plans interconnecting 43 public and private water districts to strengthen its water system to meet any emergency, according to John C. Guibert, commissioner of public works.

Mr. Guibert said he has recommended to County Executive J. Russell Sprague and the board of supervisors that the cost of linking the county's water facilities be borne by the county, the municipalities and private companies affected. Estimates of cost have not been announced.

Schenectady faces shortage

Faced with the coincident large influx of population to man defense industries and shortage of rainfall, the officials of Schenectady, N. Y., this week were seeking means of increasing the city's water supply resources.

The existing pumping system is capable of producing about 13-mgd., while demand has risen to about 15-mgd.

Among remedies under consideration is a new waterworks plant capable of producing 30-mgd.

Atlanta discusses expansion

Alarmed at the possibility of losing war industries due to inability to meet water requirements, Atlanta, Ga., has been urged to immediately consider possible sources of additional water supplies.

According to Nathaniel P. Pratt, retired consulting engineer, the city's daily consumption has doubled in the past 20 years and now has reached 40-mgd., which, Mr. Pratt said, is a close approximation of the Chattahoochee river's dependable volume. Pratt urged the city council to appoint a committee to appear before the national Congress to seek the right to acquire property and divert water from the Coosa River watershed to the Chattahoochee watershed.

Waterworks meeting to center on war problems

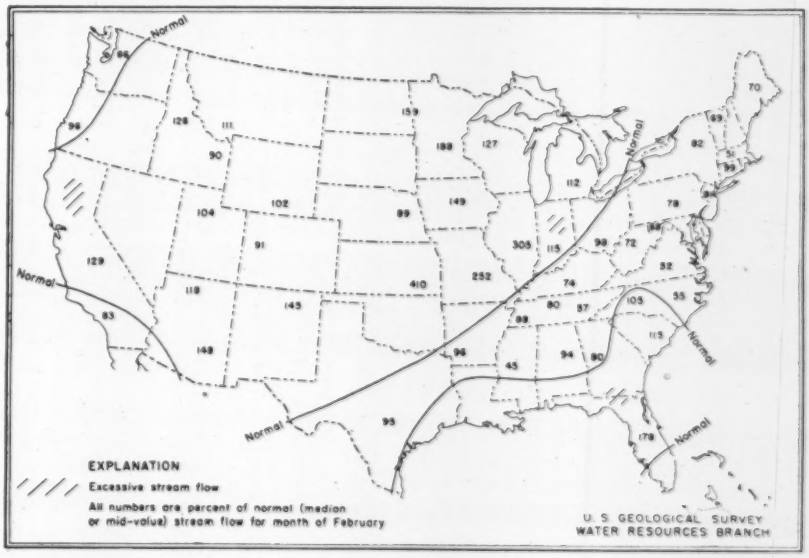
Stirred by the need for latest information on the use of substitutes, bomb damage repair and prevention, guarding of property and similar problems brought to the fore by the war emergency, members of the American Water Works Association will devote their 67nd annual meeting, June 21, at Chicago, to a conference on wartime waterworks problems, according to Harry E. Jordan, secretary.

"Nothing but an emergency will keep waterworks men away from this meeting," Mr. Jordan said, in promising complete discussion of all phases of war affecting water supply and conservation.

No stream flow deficiency reported in nation for February

The month of February was the first since July 1941, and the second since December 1940, when there were no areas of deficient stream flow in the United States. This improvement was accompanied by the increase in storage for power and the continuance of exceptionally good water conditions throughout the West.

In the East, excluding Maine, there was a decided increase in the amount of water stored for power development. Excepting in western Oregon, Washington and southern California, water conditions throughout the western half of the United States, as related both to natural flow and storage for irrigation, continued favorable. Moderate flood rises were reported during February in streams along the Atlantic seaboard from South Carolina through Georgia and Alabama. Groundwater supplies continue low throughout the Atlantic seaboard area.



Leonard Studio Photos

Erection of two main spans by two derricks operating in opposite directions from mid-river pier.

Spanning the Mississippi at Chester, Ill.

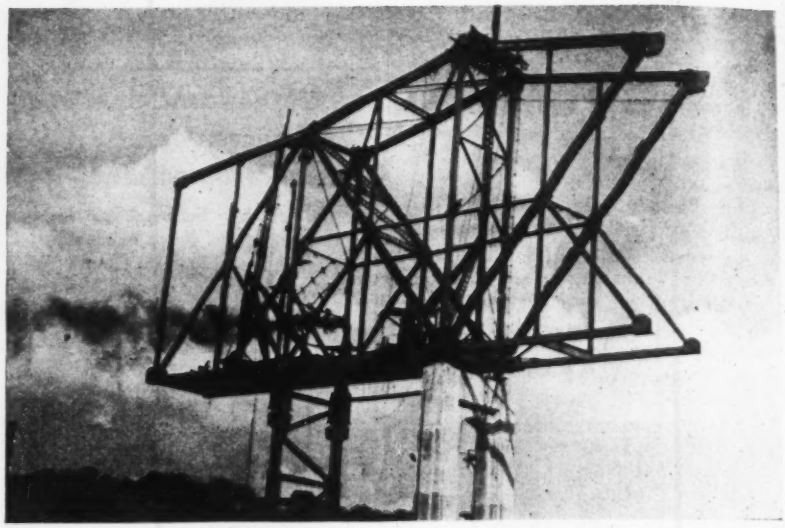
The highway bridge now under construction over the Mississippi River at Chester, Ill., to connect Illinois Route 3 and Missouri Highway 51, will be completed by spring. A 22-ft. wide roadway and two sidewalks will be provided.

Over the main channel a 1,340-ft. long continuous through truss unit of two equal spans is used. The trusses are 28½ ft. center to center and they are 100-ft. deep over the mid-river pier. This central unit is flanked at each end by a 500-ft. long continuous deck truss, while the Illinois approach is one 60-ft. I-beam span and the Missouri approach seven 60-ft. similar spans. Overall length is 2,826 ft. A clearance of 107 ft. is provided at extreme low water.

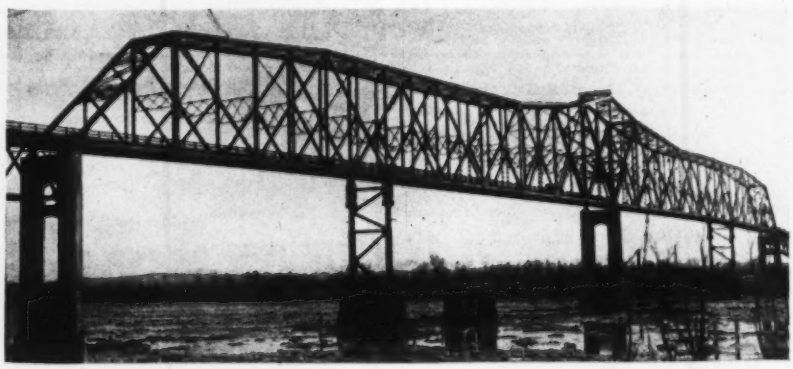
The mid-river pier and the Missouri pier supporting the main trusses were sunk with pneumatic caissons and built on rock 100 and 110 ft., respectively, below low water. The main pier on the Illinois side was constructed by means of an open cofferdam and rests on rock about 30 ft. below the surface. All piers for the Illinois approach are also carried to rock, but those for the Missouri approach rest on timber piling.

Superstructure erection

Main-span erection began at the mid-river pier and was carried out with a derrick barge and two derricks mounted on the bridge's floor system and proceeding in opposite directions. The first temporary falsework bent was located on the Illinois side at a panel length from the mid-river pier. The derrick barge then erected the two lower chords, the floor system and a portion of the trusses for the first Illinois panel. Next the two derricks, facing in opposite directions, were placed on top of the pier. After they had erected together the top chord sections over the central pier, erection was cantilevered in both directions with a balance maintained on the pier and the falsework bent. In all, three bents were required for the Illinois span, while one bent requiring a cantilever of 402 ft.—the longest on the job—was used for the Missouri side.



Later stage of work over central pier with erection balanced on pier and one falsework bent.



Two 670-ft. main spans fully erected. One falsework bent in each span is holding camber until riveting can be completed.

Each steel falsework bent rested on 40 timber piles 80-ft. long and of 40-ft. penetration. The piles were braced above water by bolted timbers and below with ¾-in. dia. steel cable. High water and swift currents occurred during the 3-month period while the bents were in place. A moderately severe 10-day flow of ice constituted a serious hazard to the falsework during this phase of the construction work.

Construction, which started October, 1940, is financed by the city of Chester. Massman Construction Co., Kansas City, with a $1,090,000 contract, is doing the foundation and superstructure work. Sverdrup & Parcel, St. Louis, are designing and consulting engineers.

WPB issues first war materials scarcity list

The Bureau of Industrial Conservation of the War Production Board last week issued the first of a planned series of provisional reports on the relative scarcity of certain materials used in the war effort. The listing serves to point out directly the availability of materials for civilian industry.

The list was divided into three groups, the first listing materials most vitally needed for war purposes, which are not generally available for civilian needs; the second, basic materials essential to the war industry, but whose supply is not as critically limited as materials in Group 1, and the third, materials available in some quantities for other than strictly war purposes.

Included under Group 1 are: alloy steel, iron alloys and wrought iron, aluminum, aluminum scrap, cadmium, chromium, lead, magnesium, nickel, tin, tinplate and terneplate, tungsten, copper, and vanadium. Also asbestos burlap and burlap products, graphite, jewel bearings, kapok, manila fibre and cordage, tin cans, and rubber.

Group 2—Mercury, mica splittings, molybdenum, antimony, beryllium-copper alloys, borax, calcium, diamond dies, steel and carbon scrap, and various types of paper.

Group 3—Asphalt, brick and tile, cement and concrete, coal and coke, flake, wallboard, wood and wood products, paper board, plywood, silver, gold.

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New York discusses post-war cross state highway

Making its first move toward definite post-war planning of state financed construction, the New York State Legislature last week considered the construction of a "throughway" which would bisect the state from Lake Erie to the Hudson River and then connect directly to New York City along the populous Hudson Valley. The proposed road would have a 200-ft. right-of-way, with four lanes of traffic separated by a mall, and there would be no grade crossing.

No money would be spent on the project until after the war emergency has passed and funds are available for such work. If approved, the route would be placed on state maps in order that any future construction could be coordinated with the master plan.

As proposed, the road is divided into four sections. The first would be the "Catskill throughway," beginning at a point on the New York-New Jersey state line near Suffern, N. Y., and extending north to a point near Rexford. The second would be the "Mohawk throughway," extending west from Rexford to Liverpool, where it would join the "Ontario throughway," continuing to East Seneca. The fourth section would be the "Erie throughway," paralleling the Lake Erie shore line from East Seneca to the Pennsylvania line.

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Court rules grading job includes rock removal

The Kentucky Court of Appeals in a recent ruling declared that when a contractor agrees to grade land he must also take the chance of having to remove rock on the property. The decision reversed a Jefferson county circuit court's directed verdict against Dr. Harold F. Miller, of Louisville, who sought to recover $1,545 from a local construction company.

Dr. Miller claimed that the company had signed a contract to grade three lots owned by him. He said the company sublet part of the work to another contractor and failed to perform work necessary to remove rocks on the property. Subsequently, he added, he was forced to pay a third company to get the work done.

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City bridge engineer of Seattle is Jap prisoner

Robert Reeves Hubbard, Seattle (Wash.) city bridge maintenance engineer, was captured by Japanese forces at Guam and is now being held a prisoner at Kobe, Japan, according to word received by relatives. Hubbard had gone to Guam on a leave of absence to aid in building a naval installation there.

Cite need for increased reservoir of engineers

The federal government needs three times more engineers than are now available for the nation's war effort, Blake R. Van Leer, dean of the School of Engineering at North Carolina State College and regional adviser for the United States Office of Educational Defense Training Program, said recently.

The government will need an additional 18,000 engineering graduates, 9,000 engineering aides, and about 40,000 inspectors in the next year, Dean Van Leer said. In addition, defense industries will need 20,000 more engineering graduates and the army and navy 12,000 for their commissioned and technically trained personnel, he added.

Kentucky seeks more students

Cooperating with the national effort to meet increased demand for engineers, the University of Kentucky's College of Engineering has mailed application blanks to persons eligible to enroll in the June class of freshmen. The engineering college will take advantage of the university's adoption of the quarter system, to be inaugurated June 11, to enroll a freshman class at the opening of the summer quarter. The summer session will extend from June 11 to August 29, and will include courses in college algebra, engineering drawing and other subjects for a total of 29 hours of classwork each week. Outstanding high school graduates are encouraged to take up the engineering course now so that they may procure one of the five engineering degrees offered in three years if they attend for all four quarters of each school year.

Newly elected chiefs of water works association

Above, left, Abel Wolman, consulting sanitary engineer and professor of sanitary engineering at the Johns Hopkins University, and new president of the American Water Works Association; and Samuel B. Morris, vice-president of the group. Mr. Morris is Dean of the School of Engineering at Stanford University. Both men were named by the Association's nominating committee January 19, and were declared elected March 1. They will assume their offices at the organization's annual meeting in Chicago, June 21-25.

A.S.T.M. committee meetings produce many new specification changes

Society's Cleveland meetings show advantages of streamlining standardization procedures to make specification revisions prompt.

Numerous emergency actions on specifications and test methods were made during the week of Mar. 2-6 at committee meetings of the American Society for Testing Materials in Cleveland. More than 500 technologists, active in the materials field, attended.

The society recently streamlined its standardization procedure so that specification revisions can be made promptly. For example, a main committee can refer recommendations supported by a letter ballot to the Society's standards committee at any time during the year. During the emergency such recommendations can also come from a subcommittee without requiring action by the larger group. In the next few weeks a large number of emergency alternate provisions will be issued to expedite procurement or conserve critical materials. The annual meeting of the A.S.T.M. will be held in Atlantic City June 22-26.

Steel

Committee A-1 on steel, approved a number of new specifications and established many emergency alternate provisions. It took one overall emergency action affecting all of its specifications in which copper may be specified by the purchaser in the amount of 0.20 percent minimum to increase corrosion resistance. The action specifies that all reference to copper be eliminated in all A-1 specifications. This affects structural shapes, plates and sheets.

One of the most important specifications issued by the committee in recent years, that for low alloy structural steel (A-242-41T) was recommended for adoption as a standard.

Five of the specifications covering concrete reinforcing material were reaffirmed as being in line with current practice. Emergency requirements, however, will be set up in the specifications for axle steel bars (A-160) providing for the use of raw material other than axle. An emergency soft structural grade is to be added with a tensile range of 48,000 to 70,000 psi, and a minimum yield point of 28,000 psi.

Action was also taken to permit the use of acid Bessemer steel in a number of pipe specifications.

Concrete

Committee C-9 on concrete and concrete aggregates, formulated plans to bring up to date the publication issued several years ago containing the symposium on significance of tests for concrete and concrete aggregate.

New definitions covering water-cement ratio, flat piece and elongated piece of aggregates, and a revised definition of blast-furnace slag will soon be issued. Also, a new proposed standard for determining air content in fresh aggregate will be recommended to the Society. This is particularly important because of rapid developments in the use of grinding aids which introduce or entrain air in concrete.

Another new specification will cover waterproof paper for use in curing concrete. The committee's widely used specification covering ready mixed concrete (C 94-41 T) is to be revised with the section on description of terms clarified, covering ready-mixed, central-mixed, shrink-mixed and transit-mixed concrete. Another new test will cover procedure for measuring the length of concrete cores drilled from structures. Much new information on this has been developed by the Public Roads Administration.

Gypsum

Since gypsum wall board is available in various edges, that is, V, tongue-and-groove, and square, revisions are to be incorporated in the specifications for recessed edge material. Also a 24-in. wide board is to be added to the 32, 36 and 48-in. widths now covered. The length range will also be changed from 4 to 12 ft. to 4 to 14 ft. Sheathing board specifications will omit all reference to ⅜-in. thick boards, and also to the 32-in. width material.

Mortars for unit masonry

Committee C-12 decided to submit to letter ballot for publication as a tentative standard a new specification for mortars for concrete unit masonry. Three grades of mortar are covered for extreme weather resistance and high stress service; for moderate weather resistance and ordinary stress service; and for service where weather resistance and stresses are minor factors. For the three grades indicated the compressor strength of 28 days of three 2-in. cubes of mortar shall be not less than 2500, 600 per sq.in., respectively.

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Plan combined course for engineering students

Plans for a new course in industrial engineering were announced recently by the schools of Engineering and Business of Johns Hopkins University, Baltimore, Md.

Aimed to prepare students for positions in industry where a knowledge of the fundamentals of both engineering and business methods are essential, the program will provide training in the basic subjects of civil, chemical, electrical and mechanical engineering as well as basic training in economics, labor practices, cost accounting, organization and management problems. Curriculum will be announced in the new engineering catalog. Freshmen and sophomore students only will be admitted initially. Upon successful completion of the program, students will be awarded the bachelor of engineering degree.

Mexican engineers participate in A.R.B.A. meeting

Representing Mexico at the American Road Builders Association meeting in Memphis, March 2-5 (ENR March 12, p. 390) was a group of engineers from Mexico headed by Carlos Bazan (second from the left) director general of highways for the Mexican government. From left to right the engineers are: J. Lorenzo Sepulveda, executive vice president, Equipos Mechanicos; Mr. Bazan; Luis Cuevas, chief engineer of design of the Mexican Department of Highways; and Jose Rivera, secretary of the Mexican Automobile Assn.

Texas engineers study problems of war program

When the Texas Section, American Society of Civil Engineers met at Austin on Mar. 12-14, construction problems connected with America's war program was the theme of the meeting. The national defense road work, airport construction, and aerial bombardment protection were major topics discussed. About 175 registered for the meeting, which is considered especially good in light of so many members of the Texas Section being now employed on defense and other rush jobs.

Above: P. M. FERGUSON (left), professor of civil engineering at the University of Texas, explains to FRED BURKETT, senior resident engineer at Ft. Worth for the Texas highway department, a few of the many problems in connection with providing aerial bombardment protection.

Most any phase of engineering might be under discussion by the three shown below. They are, left to right: CONRAD BLUCHER, Corpus Christi consultant; B. F. WILLIAMS, special assistant engineer, Texas State Department of Health; and E. N. GUSTAFSON, district highway engineer at Austin for the Portland Cement Association.

Present and past officers of the Texas Section (above) discuss highway and bridge work. They are left to right R. F. DAWSON, associate professor of civil engineering at the University of Texas and a vice president of the Texas Section; J. T. L. McNEW, professor of highway engineering at Texas A & M College and director of the society's district 15; E. R. NEEDLES, member of the New York consulting firm of Howard, Needles, Tammen, and Bergendoff and a past president of the society's Metropolitan Section (New York City); J. P. EXUM, assistant bridge engineer of the Texas highway department and general chairman of the meeting; JOHN A. FOCHT, professor of highway engineering at the University of Texas and secretary-treasurer of the Texas Section during the past five years; and E. C. WOODWARD, district engineer of the Texas highway department and president of the Texas Section.

You can be sure it was an engineering problem under discussion when the group (below) got together. They are, left to right: C. E. ELLSWORTH, district engineer, water resources branch, U. S. Geological survey, at Austin. G. G. WICKLINE, bridge engineer, Texas highway department; C. S. CLARK, member, Board of Water Engineers of Austin, Texas; CHARLIE DAVIS, consulting engineer of Ft. Worth and past president of the Texas Section; and JOHN W. PRITCHETT, member, Board of Water Engineers of Austin, Texas.

Below: H. R. F. HELLAND (left), San Antonio consulting engineer, is not telling a fish story but discusses the correct thickness for airport runway pavements. Other members of the group are, left to right: A. A. JAKKULA, professor of civil engineering at Texas A & M College; CAPT. A. H. POLLARD, engineering officer, Camp Swift, Bastrop, Texas; and S. W. FREEZE, member of the Ft. Worth consulting firm of Freeze & Nichols. Mr. Jakkula led the discussion on aerial bombardment protection following a talk on this subject by P. M. Ferguson.

MEN AND JOBS

Rolf T. Retz, since 1935 a member of the engineering staff of the Tennessee Valley Authority at Knoxville, Tenn., has accepted a post with the U. S. Engineers, at Jacksonville, Fla.

H. S. Tuttle, formerly Vilas County highway commissioner, has been appointed city engineer at Eagle River, Wis., succeeding A. L. Genisot who recently resigned.

Charles O. Davis, city superintendent of street sanitation for the city of Milwaukee, resigned recently after thirty years of service.

Allen B. Ward, New Orleans, (La.) district manager for the WPA recently resigned to join the J. H. White Engineering Corporation, New Orleans.

Donald Kimball, recent graduate of the South Dakota State School of Mines, has accepted an engineering position at Potosi, Bolivia, South America.

Willis Kommes and **Tye Rensch,** materials analysts with the South Dakota highway testing laboratory, have resigned to accept positions as principal engineering aides with the U. S. Engineers, stationed at Rapid City, S. Dak.

Herbert B. Erickson, previously assistant soil conservationist, (engineering) at Culbertson, Mont., has enlisted as a cadet in the U. S. Army Air Corps.

Wally Bowers, chief draftsman with the South Dakota highway planning survey since October 1940, has resigned to accept a position with the Bonneville Dam Authority at Portland, Ore.

L. H. Norris, resident engineer of the state highway department in Jefferson County, Ala., has been granted a leave of absence to join the Alabama Polytechnic Institute, at Auburn.

Jesse Robinson, assistant engineer in the South Dakota State Health Department has resigned to take a course in the tool design department of the Boeing Airplane Company at Wichita, Kans.

E. L. Henson, division material engineer for the Alabama State Highway Department at Decatur, has been called to active service with the U. S. Engineers.

Helmer Everson, material analyst for the South Dakota State Highway Commission's testing laboratory since 1932, has become assistant engineer with the U. S. Engineers at Rapid City, S. Dak.

Thomas G. Gallagher, pollution engineer for the Ohio Conservation Division, has resigned to become an area planning engineer in the Federal Public Work Reserve office at Columbus.

Harold M. Lewis, chief engineer and secretary of the Regional Plan Association, New York, has opened an office at 18 East 48th St., New York, as a consultant in city and regional planning, in zoning and related subjects. Mr. Lewis will continue his connection with the Regional Plan Association on a part-time basis.

Robert Hall Craig, Harrisburg, Pa., consulting engineer, has been appointed a member of the state's new Civil Service Commission, a part-time post.

Datus E. Proper, San Antonio engineer and executive vice president of the Texas Good Roads Association, has been appointed a member of the State Board of Registration for Professional Engineers. He will finish the unexpired term of the late Fred Rightor.

Oscar W. Lanzendorf, Sutter County, Cal., engineer, will resign his post effective June 30, to enter private business. He has been county engineer since 1921.

Hillary T. Rudder, city engineer for Pine Bluff, Ark. for the past nine years, has been called to active duty with the U. S. Army.

George A. Fulghum, Jr., formerly an engineer for the E. I. duPont de Nemours Co., at Charlestown, Ind., has been called to active service with the U. S. Engineers.

Lt. Col. Robert A. Sharrer, acting U. S. Army district engineer at Wilmington, N. C., recently became district engineer on the retirement of Col. Earl I. Brown.

Hugh Abbott, formerly an engineer for the Federal Power Commission at Salt Lake City, Utah, has been appointed chief engineer of the Indiana Public Service Commission.

William S. Ford, president of William S. Ford, Inc., Milwaukee management engineering firm, has been made vice president of the Trundle Engineering Co., in charge of the company's Chicago office.

Jasper W. Meals, formerly chief engineer for the James McHugh Co., of Chicago, Ill., has been called to active duty with the U. S. Army Air Corps.

Roy P. Bishop, civil engineer and director of public safety for Durham, N. C., has been called into active service with the U. S. Army. A veteran of the first World War, Mr. Bishop holds the rank of a captain.

Theodore R. Kendall, for the past 25 years engineering editor of the American City Magazine, has become consulting editor of the publication in order to devote his full time to the editorship of Contractors and Engineers Monthly. He has been succeeded as engineering editor by **William S. Foster,** formerly of the Stanley Engineering Co. of Muscatine, Ia.

Philip Fordyce has resigned as Adams County engineer at Richville, Wash., to accept a post as assistant engineer with the U. S. Engineers at Spokane.

Recent changes in the Washington Department of Highways personnel include: **Norman Hill,** district engineer at Yakima has become maintenance engineer at Olympia, succeeding **J. D. MacVicar** who resigned recently after long service; **R. H. Kenyon,** formerly Seattle district engineer, has become Yakima district engineer; **George Shearer,** formerly at Olympia, has become district engineer at Seattle, and **Earl C. Dickinson** has become right-of-way engineer.

Russell O. Crawford, superintendent of irrigation on the Tieton division of the Yakima project in the State of Washington, has been transferred to a similar position on the Sunnyside division of the same project. His place on the Tieton division will be filled by **Paul L. House,** who has been with the operation and maintenance service of the Roza division since 1939.

Frank Brasic, formerly junior highway engineer at Springfield, Ill., for the Illinois division of highways, has become junior cost engineer on the construction of a defense plant at St. Louis, Mo.

Neal Anderson, an engineer for the Bethlehem Steel Corporation, at Bethlehem, Pa., has enlisted in the U. S. Army Air Corps.

W. H. Daniel has been elected South Carolina highway commissioner to succeed **G. C. Chandler,** of Mullins, whose term expires April 15.

R. D. MacLean has resigned as city engineer at Niles, Ohio.

J. R. Graham of High Point, N. C., has been named construction superintendent for R. K. Stewart and Son, High Point contractors, working on a North Carolina defense plant.

British factories use glass despite blackouts

Windowless factories are seldom used in England despite blackouts and air raids, reported C. Howard Crane, British industrial architect on a recent visit to this country. As quoted in the *Glassic*, publication of the Libbey-Owens-Ford Glass Co., Mr. Crane said that the necessary air ducts, fans and other mechanical equipment make the windowless building too expensive to build and operate. Also the metals required are more urgently needed for other purposes. As a result, provision for windows in walls and roof monitors is as general as it ever was.

British practice is to use solid 14-in. masonry walls to a height of 8 ft., which protects from the usual bomb "splash". Above this elevation regular steel sash is used. However, only about a third of the sash area is glazed, the remainder of the panes being temporarily filled with cement-asbestos, which can be replaced with glass after the war. "We want to utilize natural air and daylight as much as possible", said Mr. Crane, and "too, in case of bombing such walls are more quickly repaired and are less costly". For blackout, the windows are provided with black curtains.

For additional protection of the workers and machinery from bomb splinters, British factories enclose every 10,000 sq. ft. of working area in 8-ft. high walls of 14-in. thick reinforced brickwork, thus providing a series of enclosures or pens. Another factory detail that has been dictated by bombing experience is the use of thin asbestos material for roofing. Lightly clipped to the framing, this material blows off under bomb blast without twisting the steelwork.

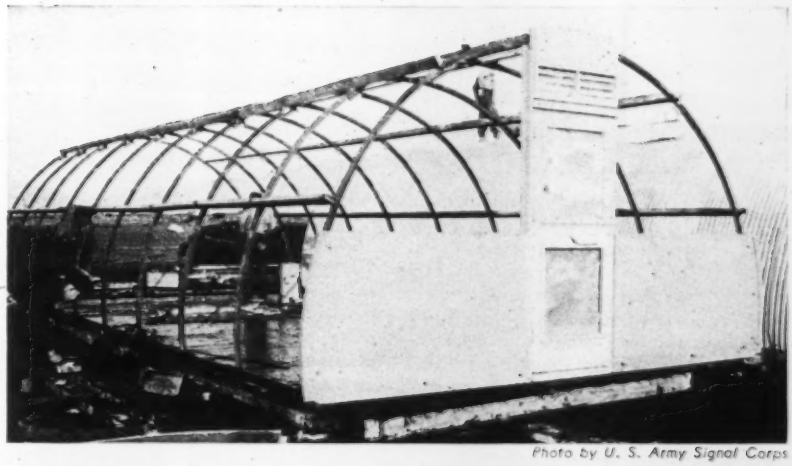

Photo by U. S. Army Signal Corps

Associated Press photo

For Iceland cold or Canal Zone heat

Demountable steel frame and sheet steel covered huts are being used extensively to house U. S. armed forces from the Arctic to the tropics. These unique structures, with their insulated walls, have been found suitable for all types of climate. The two examples shown above differ only in the type of steel framework used. The hut at the top is typical of those being used in Iceland, while the lower one illustrates the type adopted for the Panama Canal Zone. Note that the end bulkhead on the later has been moved back several feet to provide an overhanging eave for the elimination of heat and glare.

These huts originally were designed to house twelve men, but can easily be extended in length to provide quarters for any number of troops. They are about 17 ft. wide, with a ceiling height of about 9 ft. at the center line. They are readily erected or dismantled.

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Col. Brown retires from Wilmington district

Col. Earl I. Brown, of Wilmington, N. C., has returned to the Army's retired list after holding the post of district engineer at Wilmington since 1940.

Colonel Brown graduated from the U. S. Military Academy at West Point as a second lieutenant in the Corps of Engineers in 1894. and served with the Corps in the Spanish American war and the Philippine insurrection. He was district engineer at Wilmington from 1907 to 1911, and later district engineer at Galveston, Tex. and Montgomery, Ala. In 1916 he became chief of the Washington office and general purchasing agent, of the Panama Canal. During the World War he organized and commanded the 307th Engineers of the 82nd Division and the 317th Engineers of the 92nd Division.

From 1921 to 1927 Col. Brown was district engineer at Wilmington, Del., supervising the reconstruction and modernization of the Chesapeake and Delaware canal, and in 1927 became engineer of the Eighth Corps Area at Fort Sam Houston, Tex. He was division engineer of the South Atlantic Engineer Division at the time of his original retirement in 1938. Colonel Brown recently received for the second time the James R. Croes medal of the American Society of Civil Engineers.

He will continue to make his home in Wilmington.

Merge Asheville public works, engineering bureau

Due to a sharp reduction in building, believed caused by inability to obtain materials, the city of Asheville, N. C., has consolidated its engineering and public works departments.

City Manager Pat M. Burdette said fewer inspections are necessary by members of the engineering department. The move will eliminate two clerks and save the city an estimated $2,000 annually in salaries.

Markham Ferry Dam still under consideration

Although a recent order from the Bureau of the Budget at Washington, D. C., impounded funds appropriated to start construction of the $14,000,000 Markham Ferry Dam on Grand River in Oklahoma, U. S. Army Engineers held public hearings on the dam recently at Pryor, Okla. The dam would be a dual purpose hydro-electric and flood control project and when completed will be operated as a unit with Pensacola Dam, already constructed by the Grand River Dam Authority a few miles upstream, and the Fort Gibson Dam a few miles downstream, on which construction will start this spring.

The dam site is on the Grand River in Mayes county, Okla., 9 mi. southeast of Pryor. Its reservoir, in conjunction with that at Pensacola and Fort Gibson, would control about 11,660 sq.mi. of drainage area, or about 92 percent of the Grand River watershed. The dam would be a combination concrete gravity and earth fill structure, about 3,900 ft. long with a maximum height of about 90 ft.

House rejects Roosevelt's request for appropriation for White River dams

War Department civil functions appropriation totals more than $142,000,000 without funds for Bull Shoals and Table Rock.

The House last week turned down a Presidential request for funds to start construction of two new dams on the White River at a total cost of $81,500,000. In passing the War Department civil functions appropriation, the House voted down a recommendation of the appropriations committee that $18,000,000 be appropriated to start the $47,000,000 Bull Shoals Dam and at the same time supported the committee in rejecting a companion project, the Table Rock Dam.

Despite this action, total construction funds in the bill—more than $142,000,000—exceeds the amount made available last year. For general flood control, $128,273,700 would be provided, mostly for work now underway. Included is initial work on the $7,000,000 Louisville, Ky., flood control program and the $3,500,000 New Albany, Ind. project.

Included in the bill is $1,000,000 to finance advance designs of flood control jobs to be undertaken after the war.

The bill appropriates $30,000,000 and $3,210,000 respectively for flood control on the Mississippi and the Sacramento Rivers. For improvements to rivers and harbors, $20,629,000 would be provided. Continuation of power installations at Fort Peck Dam would get $1,300,000 and at Bonneville, $4,166,000.

The committee recommended $56,826,000 to continue the third locks project at the Panama Canal. This is an increase of nearly $22,000,000 over the current fiscal year.

The President three weeks ago had asked Congress for money to start both Bull Shoals and Table Rock Dams as combined flood control and power projects. Both dams would be concrete gravity structures.

Table Rock, a $34,500,000 job, is designed primarily as a storage and regulating structure, and would contain installations of only 60,000 kw. capacity, with ultimate capacity of 120,000 kw. Most of the power in the system would be generated downstream at Bull Shoals. This $47,000,000 dam will initially generate 126,000 kw. with an ultimate capacity of 336,000 kw.

These two dams would be the first to be built on the main river, although the Corps of Engineers are now building the Norfolk and Clearwater Dams on downstream tributaries. Flood control operations of the two systems would be independent, but they would form part of the same power pool.

To start these two projects, the President had asked $26,025,000.

At the same time, the President asked the $1,300,000 to finish construction of a power plant at Fort Peck Dam, and for $29,800,000 to continue work on the Prattville, Ala., Alatoona, Ga., and Bluestone, W. Va., projects. The first four of these were approved last December. (*ENR*, Feb. 12, 1942, p. 85) and are therefore not included in the regular budget.

Wide World photo

New York inspects disaster squads

Determined not to be caught napping in the event of any attack on its miles of factory, business and residential areas, New York City last week held a review of volunteer disaster equipment "batteries" which can be mobilized to meet any disaster.

Organized by the Public Works Emergency Division of the Citizens Defense Corps, a division of the Department of Public Works, the organization includes four principal divisions: contamination batteries, demolition and clearance batteries, road and sewer repair batteries and utility batteries. Each "battery" contains numerous pieces of equipment, including trucks, clamshells and steam shovels, water and hose carts, concrete mixers, and other equipment which is both city and privately owned.

About 400 pieces of equipment, manned by about 5,000 men, were included in the group gathered for inspection by Mayor F. H. LaGuardia, Irving V. A. Huie, chief of the Public Works Emergency Division, and the presidents of the city's five boroughs.

Plans authorize each borough president, acting as a deputy mayor, to order the equipment to the point in his borough where immediate attention would be required in case of attack.

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Kentucky raises truck load limit requirements

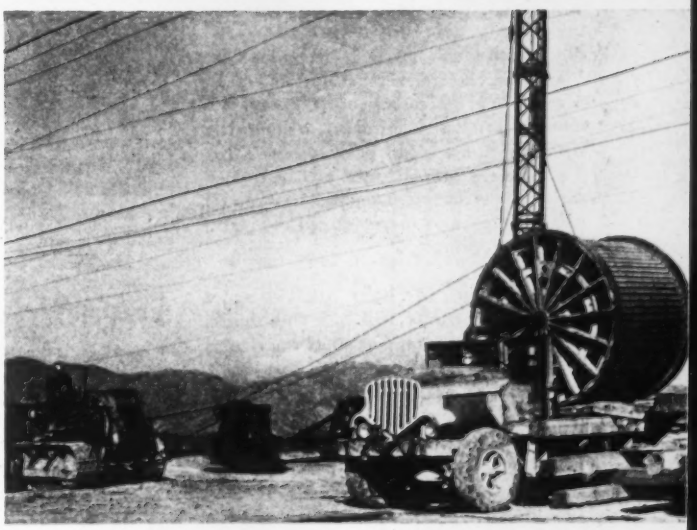
Load limits for trucks operating over designated highways in Kentucky have been increased from a gross of 18,000 lb., including truck, to 28,000 lb. State Highway Commissioner Lyter Donaldson has ordered engineers to make a survey from which a list of roads on which the raised limit is permissible will be made.

One of the job-made reels for storing a 29-ton load of 3-in. track cable used at Shasta Dam.

Each wheel (upper right) is 10 ft. in diameter and its "tire" serves as wearing surface for brake shoes used when cable is unreeled.

A winch mounted on a tractor and a block slung from the boom of a dragline (right) aid in unloading this reel of cable from one of the big trucks. The reel carries with it a shaft 7 in. in diameter.

Although taken some time ago photo (below) shows how seven cableways radiate from 460-ft. high tower.



Handling cables at Shasta Dam

EACH of the seven cableways that converge to the top of the 460-ft. high head tower at Shasta Dam has as its "main-line" a 3-in. diameter track cable that weighs 22 lb. per foot. Thus the 2,670-ft. length of one of the long main lines totals up to more than 29 tons—a sizable concentration of load when rolled up on a reel.

The process of reeling up and unreeling one of these main lines is an item in maintenance of the contractor's equipment at Shasta Dam because these cables wear and have to be replaced. Thus far, the most rapid rate of wear has occurred on No. 1 cableway about 600 ft. from the head tower, which is the point where the greatest surge occurs. Wear at this point was sufficient to make it advisable to replace this track cable after it had handled 1,200,000 tons of concrete. No. 2 cableway has shown the next highest rate of wear and required replacement after handling 1,500,000 tons. No. 3, which is still in operation with the original track cable, will carry more tonnage than the other two before replacement is necessary. Possibly the life on this No. 3 line will be as high as 2,000,000 tons. All three of these cables have the 2,670-ft. length.

The reels on which these cables are shipped from the factory are built with a central hub and shaft on which the reel can be set up on the job, with the shaft resting on suitable bearings, ready to rotate in feeding the cable directly into its permanent position. The cost of these reels, if purchased with the cable, is about $1,000. With a welding shop as well equipped as that of Pacific Constructors at Shasta, it was possible to make up several of these reels for use in handling and storing the worn cables that are taken out of service. These job-made reels consist of a central drum flanked on either end with a wheel having fourteen spokes made of 8-in. steel channels. The drum is 6 ft. in diameter and the rims of the wheels, which have an outside diameter of 10 ft., are faced with 8-in. wide steel plates to serve as braking surfaces when the cable is unreeled. Bolted-in sections in the spokes are used for fastening the ends of the cable.

WASHINGTON HIGHLIGHTS

EXPECTED CREATION of a construction industry branch in WPB failed to materialize in the recent reorganization of the branches which centralized WPB control over industry. Several changes of interest to the industry were made, however. The branch dealing with construction materials, headed by John Haynes, has been split into three. Haynes now heads a building materials branch, and temporarily also heads a lumber and lumber products branch, while W. W. Timmis is chief of a plumbing and heating branch. A new construction machinery branch is directed temporarily by W. Stevenson, but it is expected that a permanent branch chief will be named soon. Construction machinery formerly came under a transportation and farm equipment branch.

MANUFACTURE of light trucks under three tons capacity will halt this month as soon as February production quotas are exhausted, WPB decreed last week. Manufacture of heavy trucks may continue only as long as inventories of parts last—no new parts may be fabricated. However, manufacture of replacement parts will continue and be encouraged. Manufacturers may make 150 percent of 1941 output this year and are getting priority aid to do it.

A REVISED FORM of the P-19 project rating granted to war construction projects has been adopted by WPB. Known as P-19-h, it eliminates all reference to the now-obsolete priorities critical list and may therefore be used by a builder in buying any material or equipment which is to be physically incorporated into the finished project. It may not be used to buy equipment. Builders must obtain the order by applying on form PD-200, and will be issued an order P-19-h bearing a serial number and an appropriate priority rating. To use the rating, the builder must endorse on each purchase order a statement setting forth the serial number of his rating and the rating applicable. The builder's suppliers may similarly extend the rating to get the materials they need to fill his order. The first time a supplier extends a P-19-h rating he must file a form of acceptance with WPB. Builders and suppliers using the rating must report to WPB before the 15th of each month on form PD-81-A.

ROAD CONTRACTORS may not use the highway priority system to buy new equipment, it is provided in an amendment to the road priority order, P-19-e. Application of this blanket rating is now restricted to purchase of materials to be physically incorporated in the highway. An exception is made for repair parts for roadbuilding equipment, for which the rating may still be used. Contractors who need new equipment to complete a rated road job, must make separate application to WPB, using form PD-1A.

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Goodrich named head of civil protection group

Ernest P. Goodrich has been named chairman of the American Society of Civil Engineers National Committee on Civilian Protection in War Time. He succeeds Walter D. Binger, who resigned the chairmanship recently on account of the pressure of other work. Mr. Binger will continue as vice-chairman.

Mr. Goodrich, a director of the society and a member of its executive committee, has been active on the civilian protection committee since its organization.

Bay Bridge engineer wins back pay court action

The California Superior Court at Sacramento has issued a judgment in favor of Glenn B. Woodruff, former engineer of design for the San Francisco-Oakland Bay Bridge, in his suit against the State of California for back pay totaling $19,013.87. Mr. Woodruff claimed he received only $600 a month instead of $1,000 monthly minimum pay for his position during the period from December 16, 1934, to December 14, 1938.

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Speed Maryland roads

Contractors holding defense highway contracts in Maryland will be required to operate seven days a week with multiple shifts, as part of a highway speed-up program ordered recently by Governor O'Connor. The speed-up order will affect work on $11,577,826 worth of road projects.

Speeding the War Effort

America's war effort goes forward at an increasingly faster rate, through many agencies and in many fields. Here are some developments of the past week of special interest to the engineer and constructor:

The first in a series of steps to bring the vast natural resources of the South American continent to the aid of the allies will be taken shortly when a commission, headed by Dr. George C. Dunham, specialist in tropical medicine and formerly a member of the United States Army Medical Corps leaves for Ecuador. Dr. Dunham will organize a field staff to direct operations for malaria control, improvement of sewage disposal and other sanitation measures necessary before large scale production can be undertaken.

A scrap iron drive being conducted in Texas oil fields by the Texas Mid-Continent Oil and Gas Association, garnered more than 100 carloads of scrap within the first few days. Oil men in New Mexico and other western states also are cooperating in the drive.

No oil-burning heating equipment will be ordered or purchased for public buildings and other public works being constructed under the general supervision of the Federal Works Agency in 14 eastern states and the District of Columbia. FWA has ordered that where existing orders for oil-burning equipment can be cancelled equitably, and heating equipment using other fuels can be substituted, such substitution shall be made. Additionally, no oil-burning equipment for water heating and cooking will be ordered where other fuels are practical.

Secretary of Commerce Jesse Jones has announced that the Export-Import Bank has agreed to lend Brazil up to $14,000,000 for the rehabilitation of the Victoria-Minas Railway, the opening up of iron mines in the Itabira region of the State of Minas Geraes and for the improvement of ore-loading facilities at the Port of Victoria, in the State of Espirito Santo. The arrangement contemplates the acquisition of the mining properties and the railroad by the Brazilian government.

Metals fabricators have been warned by the Chemicals Branch of the War Production Board, to investigate every possible cleaning method other than chlorinated solvents applicable to their operation. A shortage in chlorinated solvents already exists, caused by the vast increase in metal fabrication. At least 30 percent of the cleaning operations in the metal industry now being done with chlorinated solvents can be accomplished by the use of other materials, the branch said.

The immediate removal of 35 miles of unused street car rails of the Indianapolis Railways, Inc., has been approved by the Indianapolis Board of Works and Sanitation. Profits from the sale of the approximately 5,000 tons of steel in the rails will be turned over to the Railways Company, which will in turn undertake to repair the streets.

OBITUARY

Charles F. Wood, 55, retired construction engineer who helped build the Pulaski Highway in New Jersey, died recently at his home in Brooklyn, N. Y.

John F. Murray, 70, formerly assistant to the chief engineer of the Pennsylvania Railroad, died March 16 at his home in Moylan, Pa.

William D. Robbins, 73, Niagara Falls city manager and formerly chief engineer of the city's power plant, died March 7.

Raymond R. Marsden, 57, dean and professor of civil engineering of the Thayer School of Dartmouth College from 1925 to 1933, and project engineer for the Atlas Powder Co., died at Wilmington, Del., March 11.

Charles R. DuBois, 55, civil engineer, died Feb. 23 at his home in Pittsburg, Kans. Mr. DuBois, who had been general superintendent in charge of outside construction at Camp Princeton, Mo., was a director of public works for the federal government in Southwestern Missouri, at the time of his death.

Andrew Christianson, 74, for many years chief engineer of the Pullman-Standard Car Mfg. Co., died March 5 at Battle Creek, Mich.

Richard A. Monks, 70, president of the civil engineering and construction firm of John Monks & Sons, New York, died at Greenwich, Conn., March 10.

Daniel Lawrence Turner, 72, chief of the New York Bureau of Transit Inspection from 1907 to 1912, and since then practicing as a consulting transit engineer, died March 11 at Norfolk, Va.

Henry Dunning Conant, 78, railroad construction engineer, died March 10 in Wauwatosa, Wis.

Col. John A. Gillies of the U. S. Engineers, was among several persons killed on Feb. 28 when an American built plane crashed north of Basra, Irak, according to reports received in New York. Colonel Gillies, 53, made his home at Amarillo, Tex.

Jose A. Camprubi, 62, editor and owner of "La Prensa," Spanish language newspaper in New York, and formerly a civil engineer for the Public Service Corp. of New Jersey, the Hudson & Manhattan Railroad and Stone & Webster, of El Paso, Tex., died March 12.

Nathaniel H. Tunnicliff, 61, civil engineer at Davenport, Iowa, died recently.

Edmund C. Miller, 37, an associate of Filtration Engineers, Inc., of Newark, died March 3 at Montclair, N. J.

Henry Jacob Baier, 68, chief engineer for the Cleveland Twist Drill Co. for 48 years, died recently at Cleveland Heights, Ohio.

Frank M. Hughes, 44, widely known engineer and contractor, died March 7 at Fremont, Ohio.

George R. Feidler, 61, bridge engineer in Division 11, of the Ohio Department of Highways, died March 7 at New Philadelphia.

S. W. Laird, 59, contractor of Jackson, Miss., died there Feb. 24.

Firman H. Crammer, 55, building contractor of Beach Haven, N. J., died March 9 at Lakewood.

Marius J. Pos, 66, former chief engineer of the Robins Conveyor Belt Co. of New York, died March 1 at St. Petersburg, Fla.

Ohmer E. Anderson, 75, building contractor, died March 10 at Fort Wayne, Ind.

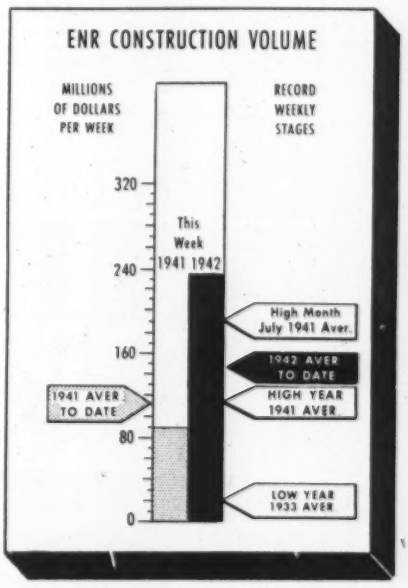
James R. Harris, retired Philadelphia architect, died March 9 at Philadelphia.

CONTRACTS AND CAPITAL

ENGINEERING CONSTRUCTION volume for the week, $273,702,000, reached the second highest peak ever attained, 105 percent above a week ago, and 206 percent over the volume for the corresponding 1941 week. The week's near-record total compares with $298,718,000 reported for the week of July 10, 1941, the all-time high.

Public construction is also at the second highest level on record, tops the preceding week by 115 percent, and is 257 percent higher than in the 1941 week. Federal work is responsible for the public gain, climbing 124 percent above last week, and 401 percent over the week last year. Private construction is up 11 percent compared with a week ago, but 19 percent below a year ago.

The week's huge construction total brings 1942 volume to $1,815,973,000, an increase of 36 percent over the $1,334,964,000 for the 12-week period last year. Private work, $167,861,000, is 55 percent below the 1941 period, but public construction, $1,648,112,000, is 71 percent higher than a year ago as a result of the 126 percent gain in federal work.



New capital for construction purposes for the week totals $29,635,000, a decrease of 9 percent from the corresponding 1941 week. The week's new financing is made up of $25,350,000 in corporate security issues, $3,865,000 in state and municipal bond sales, and $420,000 in RFC loans for public improvements.

New construction financing for the year to date, $1,412,006,000, is 95 percent higher than the $725,968,000 reported for the 12-week period in 1941.

CONTRACTS

(Thousands of dollars)

	Week Ending Mar. 20 1941	Mar. 12 1942	Mar. 19 1942
Federal	$49,301	$110,048	$246,829
State & Municipal	23,639	11,052	13,350
Total public	$72,940	$121,100	$260,179
Total private	16,618	12,167	13,523
TOTALS	$89,558	$133,267	$273,702
Cumulative 1942 (12 weeks)			$1,815,973
1941 (12 weeks)			$1,334,964

Note: Minimum size projects included are: Waterworks and waterways projects, $15,000; other public works, $25,000; industrial buildings, $40,000; other buildings, $150,000.

NEW PRODUCTIVE CAPITAL

	1941 12 weeks	Cumulative 1942 12 weeks
NON-FEDERAL	$216,968	$170,051
Corp. Securities	63,463	56,560
State & Mun.	114,004	99,242
U.S.H.A. loans	13,521	
R.F.C. loans	25,980	14,249
FEDERAL	$509,000	$1,241,955
TOTAL CAPITAL	$725,968	$1,412,006

ENR INDEX NUMBERS

Index Base = 100		1913	1926
Construction Cost	Mar. '42	269.71	129.65
Building Cost	Mar. '42	218.88	118.32
Volume	Feb. '42	507	222

FHA MORTGAGES

	Week Ending Mar. 15 1941	Mar. 7 1942	Mar. 14 1942
Selected for appraisal			
Title II	$30,898	$16,455	$17,046*
Title VI		$21,271	$26,320*

* Subject to revision.

CONTRACT UNIT PRICES

What contractors are bidding on different kinds of construction work

HIGHWAYS, NEW YORK

OWNER: Dept. of Public Works, Division of Highways, Albany, N. Y.

PROJECT: Grading, drainage structures, and reinforced concrete paving 7.83 miles of Danville-Mt. Morris State Highway in Livingston County, N. Y. Pavement is to be 8-7-8-in. concrete, reinforced.

CONDITIONS: Contractor to furnish all materials and complete work by December 1, 1942. Rail and highway transportation facilities available. Minimum wages stipulated are: skilled labor, 75c. per hr.; intermediate grade labor, 55c; and unskilled, 50c. Amount of structural steel, cast iron, and corrugated metal pipe required might seriously delay work, and tend toward raising cost of project.

BIDS: Two bids were opened December 18, 1941, the low of $712,328, and $732,797. Engineer's estimate, $744,208.

LIST OF BIDDERS:

1. Bero Engr. & Constr. Corp., North Tonawanda, N. Y. $712,328
2. D. W. Winkelman Co., Syracuse, N. Y. 732,797

Item	Quan.	Unit Prices (1)	(2)	(3)*
1. Clearing and grubbing	L. S.	$2,750.00	$2,500.00	$2,500.00
2. Unclassified excavation	328,500 c. y.	.26	.35	.35
3. Trench, culv. and brdg. excav.	16,025 c. y.	1.00	1.10	1.10
4. Overhaul	200,000 c. y.	.005	.005	.005
5. Trimming shoulders	44,000 l. f.	.20	.20	.20
6. Prepare fine grade	119,000 s. y.	.20	.20	.20
7. 12-in. vitr. sewer pipe	50 l. f.	.75	.75	.75
8. 4-in. pipe underdrain	825 l. f.	.30	.30	.30
9. 6-in. pipe underdrain	14,000 l. f.	.35	.35	.35
10. 18-in. corr. metal pipe	180 l. f.	2.97	2.70	2.70
11. 24-in. corr. metal pipe	74 l. f.	4.25	3.95	3.95
12. 30-in. corr. metal pipe	180 l. f.	5.72	5.20	5.20
13. 12-in. corr. metal pipe	250 l. f.	2.20	2.00	2.00
14. 18-in. c.i. or spec. rein. conc. pipe	920 l. f.	3.00	3.00	3.00
15. 24-in. c.i. or spec. rein. conc. pipe	750 l. f.	4.50	5.00	5.00
16. 27-in. c.i. or spec. rein. conc. pipe	200 l. f.	6.00	6.50	6.50
17. 30-in. c.i. or spec. rein. conc. pipe	550 l. f.	7.25	8.00	8.00
18. 36-in. c.i. or spec. rein. conc. pipe	802 l. f.	10.65	11.00	11.00
19. 42-in. c.i. or spec. rein. conc. pipe	400 l. f.	14.00	16.50	16.50
20. 48-in. c.i. or spec. rein. conc. pipe	420 l. f.	17.00	20.00	20.00
21. 54-in. c.i. or spec. rein. conc. pipe	140 l. f.	22.00	24.00	24.00
22. 60-in. c.i. or spec. rein. conc. pipe	72 l. f.	25.75	27.50	27.50
23. Portland cement	41,257 bbl.	2.25	2.30	2.30
24. Natural cement	5,663 bbl.	2.65	2.70	2.70
25. Conc. for structures (1:2:3½)	1,252 c. y.	18.00	20.00	20.00
26. Conc. in sidewalk and curb	140 c. y.	20.00	20.00	20.00
27. First class conc. (1:2:4)	3,310 c. y.	22.00	20.00	20.00
28. Second class concrete (1:2½:5)	45 c. y.	15.00	20.00	20.00
29. Loose stone backing, bagged screen gravel	663 c. y.	4.00	4.00	4.00
30. Metal reinf. for conc. pavmt. per sq. yd. of pavement	108,960 s. y.	.30	.30	.30
31. Steel fabric reinforcing	1,750 s. y.	.30	.30	.30
32. Reinforcing bars, structures	197,800 lb.	.07	.08	.08
33. Structural steel	631,000 lb.	.0935	.085	.085
34. Misc. iron and steel	400 lb.	.15	.15	.15
35. Pile shoes	184 ea.	1.25	1.50	1.50
36. Guard railing	17,000 l. f.	1.15	1.35	1.35
37. Reset cable guide rail	750 l. f.	.50	.50	.50
38. Guide posts	1,050 ea.	2.70	2.50	2.50
39. Reset guide posts	750 ea.	1.25	1.25	1.25
40. Metal railing	158.5 l. f.	4.95	4.50	4.50
41. Foundation course, run of bank grav.	3,800 c. y.	1.15	1.50	1.50
42. Bottom crse., bitum. matl., penet. mac	1,500 ton	3.25	3.35	3.35
43. Cement conc. pavmt	22,822 c. y.	5.70	5.00	5.50
44. Bitum. macadam, mix method optional	925 ton	7.85	8.30	8.30
45. Treat with bitum. matl	2,100 gal.	.20	.20	.20
46. Bitum. matl. waterproofing	500 gal.	.55	.50	.50
47. Memb. waterproofing without prot. crse	1,785 s. y.	1.25	1.25	1.25
48. Bitum. matl. A, paving	10,000 gal.	.13	.13	.13
49. Maintain traffic at culverts	L. S.	1,750.00	1,600.00	1,600.00
50. Maintaining traffic	2,000 l. f.	.10	.10	.10
51. Protection of traffic	L. S.	1,100.00	1,000.00	1,000.00
52. Dry riprap	605 c. y.	4.00	4.00	4.00
53. Grouted riprap	340 c. y.	7.50	8.00	8.00
54. Dismantle and store exist. bridge superstructures	L. S.	200.00	200.00	200.00
55. Cofferdams, etc	L. S.	3,300.00	3,000.00	3,000.00
56. Permanent sheeting and bracing	30 M bm.	80.00	80.00	80.00
57. Untr. timber test piles	250 l. f.	1.25	1.25	1.25
58. Furn. equip. for driving piles	L. S.	600.00	600.00	600.00
59. Screened gravel, loose measure	3,650 c. y.	2.25	2.50	2.50
60. Concrete gutters	150 s. y.	2.50	2.50	2.50
61. Conc. rt.-of-way markers	275 ea.	3.25	4.00	4.00
62. Timber and lumber	3 M bm.	5.00	100.00	100.00
63. Relay old pipe	400 l. f.	.20	.20	.20
64. Run of bank gravel backfill	310 c. y.	1.50	2.00	2.00
65. Longitudinal joint supports	8,150 ea.	.60	.60	2.00
66. Remove exist. concrete	1,100 c. f.	.25	.25	.25
67. Transverse expan. joint support	11,100 l. f. jt.	.55	.55	.55
68. Untreated timber piles	4,150 l.f.	.55	.70	.70

*Engineer's estimate.

HIGHWAY, MARYLAND

OWNER: State Roads Commission of Maryland, Baltimore.

PROJECT: Construction of 3.493 miles of dual-type highway in connection with relocation of North Point Road from Wise Avenue to point near Moffett Avenue, Baltimore, Md. Involves grading, drainage structures, macadam base course, and asphaltic concrete surface course.

CONDITIONS: Contractor to furnish all materials. Rail and highway transportation facilities available. Minimum wage rates specified are: skilled labor, 70c. per hr.; semi-skilled, 55c.; and common, 40c.

BIDS: Six bids were received January 26, 1942, ranging from the low of $434,443 to $492,294.

LIST OF BIDDERS:

1. Williams Constr. Co., Middle River, Md. (low) $434,443
2. C. J. Langenfelder & Son, Rosedale, Md. 443,005
3. Leo J. McCourt, Baltimore, Md. 450,953
4. Thomas, Bennett & Hunter, Inc., Westminster, Md. 454,874
5. Frank Carozza, Baltimore, Md. 464,126
6. John Ensey, Baltimore, Md. 492,294

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Clearing and grubbing	L. S.	$2,500.00	$9,000.00	$1,000.00
2. Class 1 excavation	73,300 c. y.	.35	.38	.33
3. Class 2 excavation	7,050 c. y.	1.00	.80	.80
4. Class 3 excavation	300 c. y.	2.50	1.75	1.50
5. Class 5 excavation	2,000 c. y.	.50	.70	3.00
6. Borrow excavation	124,000 c. y.	.55	.48	.44
7. Tamped fill	2,300 c. y.	1.00	.70	.50
8. Earth shoulders	2,250 s. y.	.15	.15	.10
9. Seeding and mulching	49,000 s. y.	.20	.23	.22
10. Furn. and place topsoil	59,100 s. y.	.25	.30	.30
11. Sodding	6,500 s. y.	.30	.28	.25
12. Trim existing ditches	500 l. f.	.25	.15	.20
13. Remove existing masonry	10 c. y.	10.00	8.00	5.00
14. 3-in. waterbound mac. sub-base	104,800 s. y.	.34	.39	.32
15. 3-in. pen. macadam sub-base	104,800 s. y.	.35	.41	.31
16. 5-in. macadam base course	6,000 s. y.	.60	.70	.42
17. Stabilized shoulders	44,400 s. y.	.38	.35	.18
18. Stabilized base course	875 ton	1.50	1.75	1.60
19. Calcium chloride	75 ton	35.00	35.00	30.00
20. Pen. macadam surf. course	6,000 s. y.	.35	.70	.80
21. Material: penetration macadam	225,500 gal.	.11	.105	.10
22. Bitum. surf. crse. (Spec. B.)	104,800 s. y.	.45	.40	.51
23. Asph. conc. base course (Spec. B)	104,800 s. y.	.65	.65	.72
24. 8-in. perf. vit. clay or conc. pipe underdrain	13,850 l. f.	.50	.60	.50
25. 8-in. vit. clay or conc. pipe underdr. outlets	750 l. f.	.50	.60	.55
26. 8-in 45-deg. v. c. or conc. elbow underdrain	24 ea.	1.00	2.50	1.00
27. 12-in. rein. concrete pipe	304 l. f.	1.25	1.50	1.35
28. 15-in. rein. conc. pipe	2,247 l. f.	1.60	1.75	1.50
29. 18-in. rein. conc. pipe	884 l. f.	2.10	2.20	1.95
30. 24-in. rein. conc. pipe	390 l. f.	3.00	3.00	2.75
31. 30-in. rein. conc. pipe	205 l. f.	4.00	3.75	3.50
32. 36-in. rein. conc. pipe	385 l. f.	5.00	4.75	4.75
33. 15-in. rein. conc. pipe elbow, 90-deg.	4 ea.	8.00	7.00	5.00
34. 15x18-in. tee section, rein. conc. pipe	1 ea.	14.00	11.00	8.00
35. 15x24-in. as above	2 ea.	20.00	16.00	12.00
36. 15x36-in. as above	1 ea.	40.00	32.00	25.00
37. 18x30-in., 45-deg. conc. pipe wye branch	1 ea.	30.00	24.00	18.00
38. Relaid pipe (any size)	100 l. f.	1.50	1.00	1.00
39. Untr. Cl. B timber piles	4,025 l. f.	1.00	.70	1.00
40. Cl. A conc., pipe endwalls	140 c. y.	30.00	32.00	25.00
41. Class A concrete	490 c. y.	25.00	26.00	23.00
42. Reinforcing steel bars	54,200 lb.	.07	.055	.04
43. Damp-proofing (Sta. 307)	L. S.	300.00	260.00	450.00
44. Aggregate backfill, underdrain	3,375 c. y.	3.30	2.25	1.50
45. 5-in. plain cement curb and gutter	575 s. y.	2.75	3.00	2.10
46. 8x18-in. white cem. conc. curb, type D	1,070 l. f.	2.00	2.75	40.00
47. Guard rail (4 cable)	3,540 l. f.	.75	.80	.73
48. Guard rail (2 cable)	180 l. f.	65	70	65
49. End anchorages	30 ea.	25.00	30.00	25.00
50. Maintenance of traffic	L. S.	2,000.00	1,500.00	400.00